

### **ABSTRACT OF THE DISCLOSURE**

Disclosed is a high density plasma processing apparatus having a resonance antenna coil. The apparatus includes a processing chamber providing a hermetically sealed plasma generating space and having a planar surface on a top wall; a plurality of gas pipes that inject process gases into the processing chamber; a plurality of loop-shaped antennas installed on the planar surface and connected in parallel; a resonance antenna coil receiving a high frequency power and including the plurality of loop-shaped antennas and a plurality of variable capacitor that are connected in parallel with the plurality of loop-shaped antennas in order to maintain a resonance state therebetween; a means for heating the resonance antenna coil by way of using a heat exchange medium; and a means for fixing a substrate inside the processing chamber parallel with the planar surface of the top wall of the processing chamber.